



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,183	02/26/2002	Shingo Ishihara	500.41280X00	2432

20457 7590 04/21/2005

ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209-3873

EXAMINER

MACCHIAROLO, PETER J

ART UNIT PAPER NUMBER

2879

DATE MAILED: 04/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary

Application No.

10/082,183

Applicant(s)

ISHIHARA ET AL.

Examiner

Peter J. Macchiarolo

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 January 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4-28 and 31-57 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4-28 and 31-57 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 January 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The reply filed on 01/28/2005 consists of changes to the drawings, claims, and further, the reply consists of remarks related to the prior rejection of claims in the previous Office Action. The above have been entered and considered. However, pending claims 4-28, and 31-57 are not allowable as explained below.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "108" and "110" have both been used to designate a passivation layer in figure 1a. The Examiner believes reference numerals "110" and "109" are intended to refer to the two layers of the transparent electrode 107. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. **Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**
4. The claim recites, " $k < \lambda / 4$ (λ : center wavelength of emitted light)." This is unclear, and the Examiner reads, " $k < \lambda / 4$; wherein λ is a center wavelength of emitted light."

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 4, 6-10, 15-24, 27, 28, 31-35, 40-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over previously cited Taniguchi et al (USPN 4954746; "Taniguchi") in view of previously cited Yamazaki et al (USPN 20010024083; "Yamazaki").**
6. Regarding claims 4, 27, and 28, Taniguchi shows in figure 4, a light-emitting element comprising an electroluminescent substrate having at least a first electrode (12), a luminescent layer (14) and a second transparent electrode (16) formed on a substrate (11), a counter substrate (1) and a light extraction layer (space between 16 and 6) provided between the organic electroluminescent substrate and the counter substrate.

Art Unit: 2879

7. Taniguchi is silent to the luminescent layer being organic, and an auxiliary electrode for the second transparent electrode (means for lowering resistance for the second transparent electrode).

8. However, having an organic luminescent layer and an auxiliary electrode for the second transparent electrode is an obvious and well-known configuration, as evidenced by Yamazaki. This configuration has numerous known advantages, such as reduced power consumption.

9. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct Taniguchi's device using organic light emitting element with auxiliary electrodes on the second transparent electrodes to allow for reduced power consumption.

10. Regarding claims 6 and 31, Taniguchi shows in figure 4, a rib (22) is provided between the organic electroluminescent substrate and the counter substrate to control a thickness of the light extraction layer.

11. As discussed above, Taniguchi is silent to an auxiliary electrode.

12. However, one of ordinary skill in the art will realize the combination of Taniguchi and Yamazaki's devices will yield the rib being provided over the auxiliary electrode.

13. The motivation and reasons for combining is the same as for claim 4.

14. Regarding claims 7 and 32, both Taniguchi and Yamazaki are silent to the light extraction layer being 50 μm or more.

Art Unit: 2879

15. However, this is an obvious configuration, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Further, one would be motivated to construct Taniguchi's light extraction layer longer than 50 μm for a variety of reasons, such as to make certain that if the two substrates warp, there is enough clearance between the electrodes so as not to develop a short circuit.

16. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the optical device of Taniguchi and Yamazaki with the light extraction layer being 50 μm or more to facilitate reliable operation.

17. Regarding claims 8 and 33, Taniguchi shows the rib is formed on the counter substrate via the copper film 21 and electrode 2.

18. Regarding claims 9 and 34, Taniguchi shows the rib is formed from a polyimide.

19. Although Taniguchi is silent to the polyimide being an optically cured resin, it would have been obvious to one having ordinary skill in the art that the time the invention was made to use an optically cured resin, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416. Further, one would arrive at this modification for a variety of reasons, including material availability and manufacturing processes with sensitive requirements.

Art Unit: 2879

20. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the optical device of Taniguchi and Yamazaki with the rib being formed from an optically cured resin.

21. Regarding claims 10 and 35, Taniguchi shows in figure 7, the rib is formed on a sealed portion (via copper and solder) of the organic EL substrate and the counter substrate.

22. Regarding claims 15, 17, and 40, Taniguchi is silent to auxiliary electrodes.

23. However, having auxiliary electrodes being formed between pixels is an obvious modification, as evidenced by Yamazaki, since this will prevent light from being attenuated by the opaque auxiliary electrodes. Furthermore, Yamazaki teaches that the auxiliary electrodes should be formed on the transparent electrodes to reduce power consumption.

24. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the optical device of Taniguchi, with the auxiliary electrodes being between pixels and on the second transparent electrode, since this will allow for a brighter display with reduced power consumption.

25. Regarding claims 16 and 41, Taniguchi and Yamazaki are silent to auxiliary electrodes being formed on the counter substrate.

26. However, one of working skill using organic EL technology will be able to suitably rearranging the auxiliary electrodes on the counter substrate, and is a matter of obvious design

Art Unit: 2879

choice. *In re Japikse*, 86 USPQ 70. One would be motivated to such a configuration for a variety of reasons, including easing manufacturing processes.

27. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the auxiliary electrodes on the counter substrate.

28. Regarding claims 18 and 42, although Yamazaki is silent to a bonding layer being provided to bring the second transparent electrode and the auxiliary electrode into ohmic contact with each other, this is an obvious configuration. One of ordinary skill in the art will appreciate this configuration is necessary for proper operation of the device, and will lower the overall power consumption.

29. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the optical device of Taniguchi and Yamazaki with the auxiliary electrode and second transparent electrode being bonded together to provide ohmic contact with each other to lower the overall power consumption of the device.

30. Regarding claims 20 and 44, Taniguchi shows in figure 1 a light-emitting display using the organic light-emitting element recited in claim 4.

31. Regarding claims 19, 22, 43, and 46 Taniguchi discloses the second transparent electrode is formed from a very thin metal film with a high transmissivity.

32. Regarding claims 21, 23, 45, and 47 Taniguchi mentions the organic light emitting element has pixels of different colors.

33. The Examiner notes that the preamble of claims 23 and 47 recite that the display is used a mobile phone. This is an intended use type preamble, since it merely recites the intended use of a display. Where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone, the preamble is generally not accorded any patentable weight. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951). In this case, the preamble has been considered, however is not patentable over Taniguchi since the display can be used in a mobile phone.

34. Regarding claims 24 and 48, Taniguchi discloses the first electrode is a transparent electrode.

35. Regarding claims 49-51, Taniguchi discloses that the space can be filled with a silica gel, which is known to have a refractive index close to 1 (approximately 1.4).

36. Regarding claims 52-57, Taniguchi discloses that the space can be evacuated or filled with a hydroscopic agent.

37. Taniguchi and Yamazaki are silent to filling the light extraction layer with an N₂, He, Ne, or Ar.

Art Unit: 2879

38. However, one of ordinary skill in the art will be motivated to fill the light extraction layer with one of the recited gases, since Taniguchi infers that moisture and oxidation is unwanted in the light extraction layer, and the gasses are known to be extremely stable and will not oxidize the light emitting element.

39. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the device of Taniguchi and Yamazaki and adding N₂, He, Ne, or Ar in the light extraction layer to prevent unwanted oxidation, thereby yielding a more stable and long-lived device.

40. **Claims 11, 12, 26, 36, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi in view of Yamazaki in further view of Ishihara et al (USPN 5864206; "Ishihara").**

41. Regarding claims 11, 12, 36, and 37, both Taniguchi and Yamazaki are silent to using color filters.

42. However, Ishihara teaches that the transparent glass substrate may be a glass substrate having formed thereon a filter corresponding to an RGB color component,¹ and this configuration improves color purity.

43. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the optical device of Taniguchi and Yamazaki with the color filter to improve color purity.

¹ Ishihara, col. 10, ll. 49-54.

Art Unit: 2879

44. Regarding claim 26, Taniguchi discloses the first electrode is a transparent electrode.

45. Although Taniguchi is silent to white light being emitted from the second transparent electrode into the light extraction layer, one of ordinary skill in the art will realize the optical device shown in figure 1 will produce white light, and Ishihara's color filters on Taniguchi's device will result in colored light being emitted from the counter substrate. One would be motivated to this configuration to ensure the different colors are emitted from the same plane, thereby eliminating any problems associated with viewing angle.

46. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the optical device of Taniguchi, Yamazaki, and Ishihara with the recited configuration to eliminate any problems associated with viewing angle.

47. **Claims 13, 14, 38, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi in view of Yamazaki in further view of Inohara et al (USPN 4357557; "Inohara").**

48. Regarding claims 13 and 38, both Taniguchi and Yamazaki are silent to a moisture absorbing layer being provided on the counter substrate.

49. However, this is an obvious configuration as evidenced by figure 1 of Inohara. One would be motivated to such a configuration since it is well known that organic EL layers are extremely susceptible to moisture, and this will increase the overall lifetime of the device.

50. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the optical device of

Taniguchi and Yamazaki with a moisture absorbing layer on the counter substrate to increase the overall lifetime of the device.

51. Regarding claims 14 and 39, Taniguchi and Yamazaki are silent to a moisture absorbing layer being provided around a portion sealing the organic EL substrate and the counter substrate.

52. However, this is an obvious configuration as evidenced by figures 4 and 5 of Inohara.

53. The reason for combining and motivation are the same as for claim 13 above.

Allowable Subject Matter

54. Claim 5 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

55. Regarding claim 5, the prior art of record fails to disclose or motivate one skilled in the art to construct the EL device wherein a total thickness d of a layer ranging from a light-emitting area in the organic layer to the second transparent electrode satisfies an equation $d < \lambda/4$, wherein λ is a center wavelength of emitted light, in combination with the remaining limitations of the claim.

Response to Arguments

56. Applicant's arguments filed 01/28/2005 have been fully considered but they are not persuasive.

57. First, Applicant alleges that the closed space between the elements 6 and 16 of Taniguchi does not function as a light extraction layer. The Examiner respectfully disagrees and reminds

Art Unit: 2879

Applicant that no special definition has been given to “a light extraction layer.” Applicant’s instant specification merely discloses that a light extraction layer is characterized in that “it is formed from a material with refractive index close to 1.” With this definition, coupled with Applicant’s figures, one skilled in the art would understand the light extraction layer merely comprises a void that is filled with a material having a refractive index close to 1. The Examiner further points out that Taniguchi discloses a void which can be filled with a silica gel (it is known in the art that silica gel has a refractive index close to 1, i.e. $n \sim 1.4$). Therefore, one skilled in the art will recognize that Taniguchi does indeed disclose a light extraction layer as described by Applicant.

58. The Examiner respectfully reminds Applicant that a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 370 F.2d 576, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 312 F.2d 937, 939, 136 USPQ 458, 459 (CCPA 1963). Taniguchi’s space will be able to extract light.

59. Secondly, Applicant's arguments with respect to claim 5 have been considered but are moot in view of the new ground(s) of rejection.

60.

Conclusion

61. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

62. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

63. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter J Macchiarolo whose telephone number is (571) 272-2375. The examiner can normally be reached on 8:30 - 5:00, M-F.

64. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar Patel can be reached on (571) 272-2475. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

65. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

Art Unit: 2879

system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



ASHOK PATEL
PRIMARY EXAMINER